

Southeastern Wisconsin Water Supply Issues and Regional Water Supply Planning Program Overview

**Presentation for
Groundwater Advisory Committee Meeting
June 3, 2005**



Southeastern Wisconsin Water Supply Issues and Regional Water Supply Planning Program Overview

- Presentation Overview
- Regional Setting
- Water Supply Issues
- Regional Water Supply Planning Program
- Planning Challenges

Southeastern Wisconsin Water Supply Issues and Regional Water Supply Planning Program Overview

Areas Served by Public and Private Water Supply Systems in Southeastern Wisconsin: 2000

2,700 Square Miles
(62% west of Divide)

2.0 Million People

Public Water Supply

➤ Lake Michigan

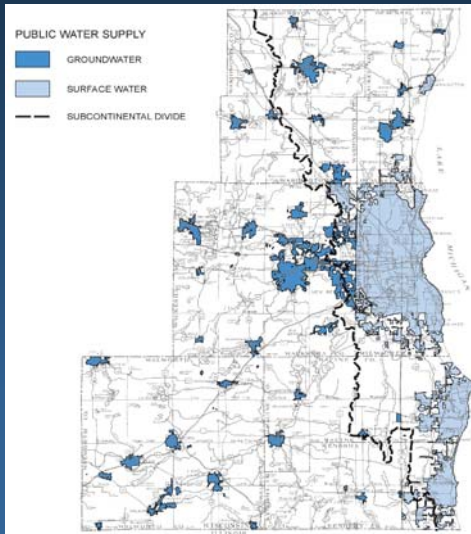
- Nine Plants (30 systems)
- 1.2 Million People
- 210 mgd

➤ Groundwater

- 50 Systems
- 400,000 People
- 55 mgd

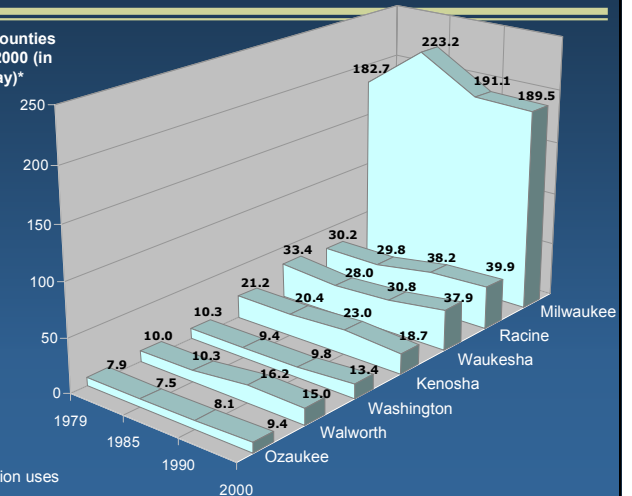
Private Water Supply

- 400,000 People
- 40 mgd



Southeastern Wisconsin Water Supply Issues and Regional Water Supply Planning Program Overview

Trends in Water Use for Counties Within the Region: 1979-2000 (in Million Gallons Per Day)*

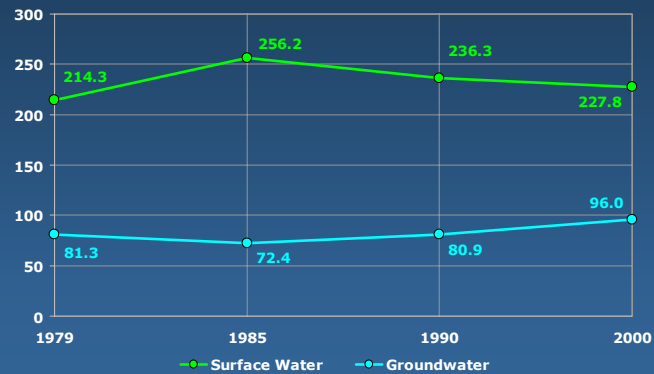


* Excludes power generation uses



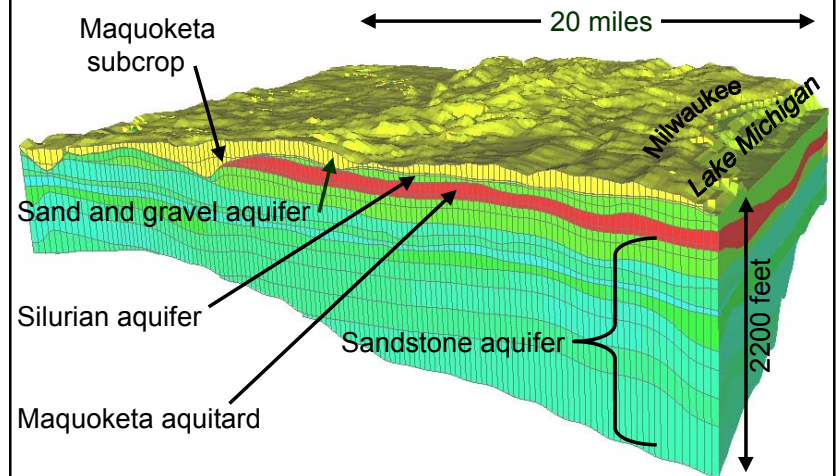
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Trends in Water Use for the Region: 1979-2000
(in Million Gallons Per Day)*



* Excludes power generation uses

General Hydrogeology of Southeast Wisconsin





Water Supply Issues Focus on Southeastern Wisconsin

- Deep Aquifer System
- QUANTITY. Historic and Continued Drawdown of Up to Four to Five Feet per Year
- QUALITY. Concerns in Some Systems Related to Radium and Dissolved Solids
 - RADIUM COMPLIANCE ISSUES. 22 Systems in Southeastern Wisconsin (53 in Wisconsin)
 - COMPLIANCE DATES. 2006-2009

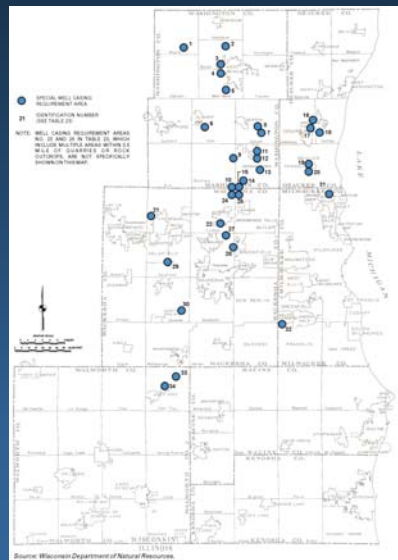


Water Supply Issues Focus on Southeastern Wisconsin

- Shallow Aquifer System
- CURRENT QUANTITY. Currently Limited Problems Due to Seasonal and Longer-Term Dry Weather Conditions. Problems Are Limited in Extent—Not Widespread
- FUTURE QUANTITY. There Are Sustainability and Potential Surface Water and Wetland Base Flow Impacts If Uses Greatly Increase, Particularly If This Aquifer is Used As An Alternative to the Deep Aquifer
- SURFACE WATER CONFLICTS. Conflicts Over New Well Sitings and Surface Water Advocates/Existing Groundwater Users
- QUALITY. Isolated Problems
 - Arsenic Concerns. Six Municipal Systems
 - 24 Special Well Casing Areas

Water Supply Issues Focus on Southeastern Wisconsin

LOCATION OF SPECIAL WELL CASING REQUIREMENT AREAS IN SOUTHEASTERN WISCONSIN



Water Supply Issues Focus on Southeastern Wisconsin

- Lake Michigan Supply
- LAKE MICHIGAN. Treated Water is An Ample, High-Quality Source. Its Use is Constrained By Diversion Laws and Policies. Current Treatment Plants Have Substantial Potentially Excess Capacity (over 100 million gallons per day in reserve capacity at nine plants)



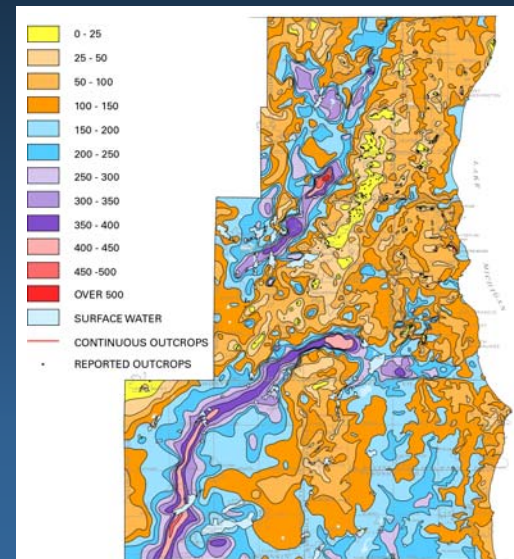
Southeastern Wisconsin Water Supply Issues and Regional Water Supply Planning Program Overview

Regional Water Supply Planning Program – Three Elements (Coordinated With And Designed To Complement Local Actions)

- Conduct Basic Groundwater Inventories (Completed in 2001 With Partners—WGNHS and WDNR)
- Collect Additional Inventory Data and Develop Regional Groundwater Simulation Model (Completed with Partners—USGS, WGNHS, UW-Milwaukee, WDNR, and SE Wisconsin Water Utilities)
- Prepare Regional Water Supply System Plan (Planning is Underway)

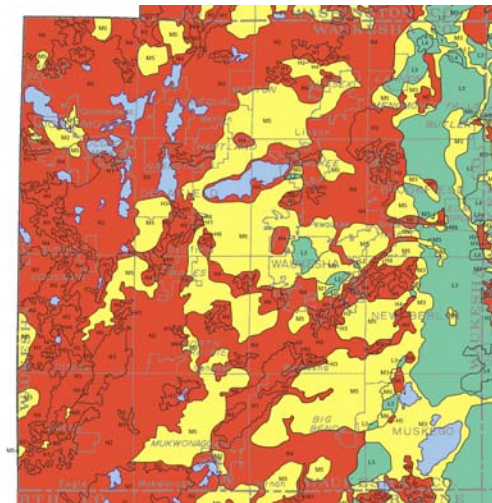
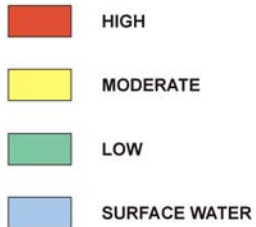
First Element – Basic Groundwater Inventories

Depth to Bedrock in Southeastern Wisconsin



First Element – Basic Groundwater Inventories

GROUNDWATER CONTAMINATION POTENTIAL



Second Element – Groundwater Model Development

A Cooperative Project...



SE Wisconsin
Water Utilities





Third and Final Element Proposed Regional Water Supply Plan

- Development of Public Water Supply Service Areas and of Forecast Demand for Water Use
- Development of Recommendations for Water Conservation Efforts to Reduce Water Demand
- Evaluation of Alternative Sources of Supply, Culminating in Identification of Recommended Sources of Supply for Each Service Area and in Recommendations for Development of the Basic Infrastructure Required to Deliver that Supply



Third and Final Element Proposed Regional Water Supply Plan (continued)

- Identification of Groundwater Recharge Areas to Be Protected from Incompatible Development
- Specification of Any New Institutional Structures Found Necessary to Carry Out the Plan Recommendations
- Identification of Any Constraints to Development Levels in Subareas of the Region that May Emanate from Water Supply Sustainability Concerns



Southeastern Wisconsin Water Supply Planning Challenges

OVERALL CHALLENGE – To Develop a Plan for the Provision of Long-Term Sources of High-Quality Water for the Southeastern Wisconsin Region

- Determine a Balance and an Efficient Management Program for Sources of Supply:
 - Lake Michigan
 - Shallow Aquifer
 - Deep (Regional) Aquifer (with treatment)
 - Precipitation (?)
 - Infiltration Systems
 - Enhanced Precipitation
 - Wastewater (?)



Southeastern Wisconsin Water Supply Planning Challenges

- Balance Groundwater Water Supply Needs with Surface Water Impacts
- Integration of Water Supply Planning with Land Use and Comprehensive (“Smart Growth”) Planning
- Water Conservation
- Cooperate and Coordinate with Tri-State Consortium



Southeastern Wisconsin Water Supply Planning Challenges

Balance Groundwater Water Supply Needs With Surface Water Impacts

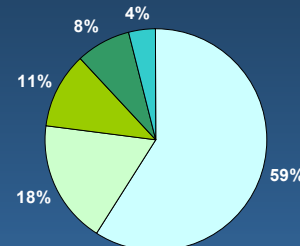


Southeastern Wisconsin Water Supply Planning Challenges

Balance Groundwater Water Supply Withdrawal Needs with Surface Water Impacts

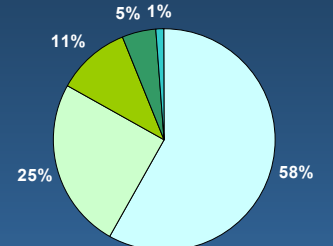
Sources of Water Pumped From Wells Other Than Those Private Wells Accompanied by Onsite Sewage Disposal Systems

Deep Pumping: 33.3mgd



- Reduced flow to inland surface water
- Groundwater flow from outside SEWRPC region
- Reduced groundwater storage
- Reduced groundwater flow toward Lake Michigan
- Groundwater flow out of Lake Michigan

Shallow Pumping: 32.5mgd



- Reduced flow to inland surface water
- Flow out of inland surface water
- Reduced groundwater storage
- Reduced groundwater flow into Lake Michigan
- Groundwater flow out of Lake Michigan



Southeastern Wisconsin Water Supply Planning Challenges

*Balance Groundwater Water Supply Withdrawal Needs
with Surface Water Impacts*

**Area from which Groundwater
Is Contributed to Upper
Phantom Lake**



Southeastern Wisconsin Water Supply Planning Challenges

CHALLENGE – Balance Groundwater Water Supply Needs with Surface Water Impacts

- Tools to Quantify Impacts on a Hydrologic Unit Basis
 - Groundwater Models
 - Surface Water Analysis (Models?)
- Willingness to and/or Regulation Requiring Consideration of Surface Water Impacts in Initial Regional- and Subregional-Level Planning and in Site-Specific Situations



Southeastern Wisconsin Water Supply Planning Challenges

CHALLENGE – Balance Groundwater Water Supply Needs with Surface Water Impacts

- Willingness to Balance Impacts and Recognize Some Surface Water Impacts Are Unavoidable (reasonableness)



Southeastern Wisconsin Water Supply Planning Challenges

CHALLENGE—Integration of Water Supply Planning with Land Use and Comprehensive (“Smart Growth”) Planning

- Link Reasonably Expected Water Supply Capacities As One of Several Factors Considered in Future Land Use Decisions
- Take Into Account Important Water Supply Considerations in Establishing Land Use Patterns
 - Preserve Important Groundwater Recharge Areas (Areas to be Identified in Regional Plan)
 - Protect Existing and Future Well Zone of Contribution Areas
 - Promote Local Zoning to Protect Areas Most Susceptible to Groundwater Contamination (Areas Identified in Regional Plan)



Southeastern Wisconsin Water Supply Planning Challenges

CHALLENGE—Integration of Water Supply Planning with Land Use and Comprehensive (“Smart Growth”) Planning

- Promote Low Impact and Other Development Patterns and Stormwater Management Practices Which Maintain the Natural Hydrology
- Potential Limits to Development Density in Selected Areas to Help Achieve a Safe Water Supply (Regional Plan to Develop Initial Recommendations Based Upon Six (?) Test Areas)



Southeastern Wisconsin Water Supply Planning Challenges

CHALLENGE – Water Conservation

- Determine What Levels Are Achievable and At What Cost
- Balance Conservation and Economic Development Objectives
- Implementation – How to Achieve



Southeastern Wisconsin Water Supply Planning Challenges

CHALLENGE – Coordination With Adjacent Related Areas

- Tri-State Consortium
- USGS, WGNHS Counterparts